IN THE CLAIMS

1. (Cancelled)

2. (Presently amended) The method of claim 1 13, wherein said upstream user message contains information to identify said message sender.

3. (Presently amended) The method of claim 1 13, wherein said upstream user message contains information to identify the designated message receiver.

4. (Presently amended) The method of claim 1 13, wherein said predetermined factor to classify the type of message is based on the size of said message.

5. (Presently amended) The method of claim 1 13, wherein said predetermined factor to classify type of message is based on the level of priority of said message.

6. (Previously amended) The method of claim 3, wherein a receiver of said type-two message returns an acknowledgement to a sender of said type-two message upon successful receipt of said type-two message.

7. (Previously amended) The method of claim 4, wherein said type-one message, said reserve request, and said type-two message are transmitted using a standard packet cell data structure, wherein said messages can be further segmented and encapsulated into a multi-packet cell comprising a plurality of packet cells.

8. (Previously amended) The method of claim 7 wherein a first packet cell of said multi-packet cell contains the total number of packet cells for said message and each said packet cell having information to identify its packet cell sequence within the multi-packet cells.

9. (Presently amended) The method of claim 2 whereby receiving a type-one message from the downstream channel by said message sender serves as an acknowledgment to indicate that other users of said subset and said communication server successfully received said type-one message.

10. (Previously amended) The method of claim ~~1~~ 13, wherein said users buffer said messages for a pre-determined period of time after receiving a reserve request.

11. (Cancelled)

12. (Previously amended) The method of claim 7, wherein said packet cell of said message further comprises at least one header portion and at least one data portion; wherein one designated bit of the header portion is set to identify said packet cell as a reserve request.

13. (Presently amended) A method of providing medium access control over an upstream channel in a communication network system serving a plurality of system users,

having an upstream channel for carrying upstream messages from at least a subset of the plurality of system users to a communication server and a downstream channel connecting said communication server to said system users of said subset, the method comprising ~~the steps of~~:

(a)   classifying upstream user messages as a type-one or a type-two message based on a predetermined factor wherein a copy of type-one messages will be distributed from a user of the subset of users to all users in said subset of users;

(b)   for each type-two message, defining a type-one message, as a reserve request, directed to all other users in the subset of users to reserve upstream channel usage to the sending user for sending a type-two message;

(c)   said users selectively buffering said messages such that type-one messages are buffered if a reserve message has been received and type-two message are buffered until after its associated type-one message is sent and received by the other users wherein said users buffer said messages for ~~an optimal~~ a̲ backoff time;

(d)   calculating the backoff time, each time said user completes an upstream transmission or receives a reserve request from another user of said subset, where said calculation is based on a plurality of factors including the message round-trip propagation time, the size of last upstream message sent by said user, and the total number of current on-line users of said subset tracked by said communication system, and

(e)   tracking the total number of current on-line users of said subset wherein tracking said total number of current on-line users of said subset comprises:

periodically sending a first special message containing said total number of current on-line users of said subset by the last log-in system user into said subset;

monitoring said first special message for a predetermined period of time when a new system user first ~~log-in~~ logs into said subset ~~called a "log-in" mode~~;

said new system user which has received said first special message starting to send periodically a second special message having said total number of current on-line users of said subset incrementing by one;

stopping sending said first special message by said last log-in system user once it has received said second special message from said new system user, said new system user becoming said last log-in system user of said subset;

sending a third special message into said system by a system user ready to log-out of said subset;

said last log-in system user which has received said third special message decrementing said total number of current on-line users of said subset by one; and

resetting and recounting said total number of current on-line users of said subset if needed.

14. (Presently amended) A method of providing medium access control over an upstream channel in a communication network system serving a plurality of system users, having an upstream channel for carrying upstream messages from at least a subset of the plurality of system users to a communication server and a downstream channel connecting said communication server to said system users of said subset, the method comprising ~~the steps of~~:

(a) classifying upstream user messages as a type-one or a type-two message based on a predetermined factor wherein a copy of type-one messages will be distributed from a user of the subset of users to all users in said subset of users;

(b) for each type-two message, defining a type-one message, as a reserve request, directed to all other users in the subset of users to reserve upstream channel usage to the sending user for sending a type-two message;

(c) said users selectively buffering said messages such that type-one messages are buffered if a reserve message has been received and type-two message are buffered until after its associated type-one message is sent and received by the other users wherein said users buffer said messages for ~~an optimal~~ a backoff time;

(d) calculating the backoff time, each time said user completes an upstream transmission or receives a reserve request from another user of said subset, where said calculation is based on a plurality of factors including the message round-trip propagation time, the size of last upstream message sent by said user, and the total number of current on-line users of said subset tracked by said communication system, and

(e) tracking the total number of current on-line users of said subset wherein tracking said total number of current on-line users of said subset comprises:

6

periodically sending a first special message containing said total number of current on-line users of said subset by the last log-in system user into said subset;

monitoring said first special message for a predetermined period of time when a new system user first ~~log-in~~ logs into said subset ~~called a~~ ~~"log-in" mode~~;

said new system user which has received said first special message starting to send periodically a second special message having said total number of current on-line users of said subset incrementing by one;

stopping sending said first special message by said last log-in system user once it has received said second special message from said new system user, said new system user becoming said last log-in system user of said subset;

sending a third special message into said system by a system user ready to log-out of said subset;

said last log-in system user which has received said third special message decrementing said total number of current on-line users of said subset by one; and

resetting and recounting said total number of current on-line users of said subset if needed wherein said resetting and recounting further comprises:

issuing a recounting message by said last log-in system user;

said last log-in system user issuing a first special message

having a total number of current on-line users of said susbset set to

be one; and

the rest of said current on-line users of said subset

incrementing said total number of current users of said subset by

successively becoming said last log-in system user.

15-18. (Cancelled)

19. (Presently amended) A CATV network system implementing a medium access

control mechanism, having a headend, a downstream channel connecting said headend

with a plurality of settop users and carrying downstream messages, and at least an

upstream channel connecting said headend with a plurality of settop users and carrying

upstream messages, the system comprising:

(a)   means for buffering a message and classifying said message as a type-one

or a type-two message based on a predetermined factor by a message sender;

(b)   means for said message sender to transmit a copy of said buffered message

into said upstream channel immediately if the message is a type-one message, and issuing

a special type-one message, a reserve request, into said upstream channel immediately if

said buffered message is a type-two message;

(c)   means for transferring said type-one message and said reserve request

directly from said upstream channel into said downstream channel;

(d)   means for inducing other settop users which have received said reserve request from said downstream channel to refrain from transmitting into said upstream channels for a period of time equal to a reservation time plus additional guard band;

(e)   means for transmitting a copy of said buffered type-two message into said upstream channel by said reserve request sender once it has received said reserve request it sent from said downstream channel;

(f)   means for responding by said headend by sending an acknowledge to said type-two message sender to indicate successful receipt of said type-two message;

(g)   ~~mean~~ means for removing said buffered type-two message from buffering by said type-two message sender when it receives said acknowledge;

(h)   means for re-transmitting said message after a predetermined period of time if the number of retries has not exceeded a predetermined maximum retry count; and

(i)   wherein ~~an optimal~~ a backoff time is calculated every time for each settop user completing transmitting said upstream message or receiving a reserve request ~~form~~ from another user, comprising:

(1)   means for tracking the number of concurrent settop users in said communication system;

(2)   means for tracking the size of a last message sent by said sending settop user; and

(3)   means for calculating ~~an optimal~~ the backoff time by using said number of concurrent settop users, said size of the last message and round-trip propagation time.

20. (Presently amended) A CATV network system implementing a medium access control mechanism, having a headend, a downstream channel connecting said headend with a plurality of settop users and carrying downstream messages, and at least an upstream channel connecting said headend with a plurality of settop users and carrying upstream messages, the system comprising:

(a) means for buffering a message and classifying said message as a type-one or a type-two message based on a predetermined factor by a message sender;

(b) means for said message sender to transmit a copy of said buffered message into said upstream channel immediately if the message is a type-one message, and issuing a special type-one message, a reserve request, into said upstream channel immediately if said buffered message is a type-two message;

(c) means for transferring said type-one message and said reserve request directly from said upstream channel into said downstream channel;

(d) means for inducing other settop users which have received said reserve request from said downstream channel to refrain from transmitting into said upstream channels for a period of time equal to a reservation time plus additional guard band;

(e) means for transmitting a copy of said buffered type-two message into said upstream channel by said reserve request sender once it has received said reserve request it sent from said downstream channel;

(f) means for responding by said headend by sending an acknowledge to said type-two message sender to indicate successful receipt of said type-two message;

10

(g)   ~~mean~~ means for removing said buffered type-two message from buffering by said type-two message sender when it receives said acknowledge;

(h)   means for re-transmitting said message after a predetermined period of time if the number of retries has not exceeded a predetermined maximum retry count;

(i)   means for grouping a plurality of settop users with a downstream transmitter between said headend and said settop users;

(j)   means for grouping a plurality of users with a upstream transmitter between said headend and said settop users; and

(k)   means for forwarding a copy of said type-one message from said upstream transmitter directly to said downstream transmitter wherein said type-one message will be received by said plurality of settop users grouped by said downstream transmitter.